

Date: Wed, 4 Aug 93 04:30:17 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V93 #1
To: Ham-Ant

Ham-Ant Digest Wed, 4 Aug 93 Volume 93 : Issue 1

Today's Topics:

- a QST and 73 articles on apartment antennas (vhf mostly)
 - balanced and unbalanced lines? (2 msgs)
 - GAP antenna (2 msgs)
- Some Fundamental Antenna Questions (3 msgs)
 - VHF homebrew?

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 3 Aug 1993 10:58:05 -0400
From: vtserf.cc.vt.edu!csugrad.cs.vt.edu!not-for-mail@uunet.uu.net
Subject: aQST and 73 articles on apartment antennsas (vhf mistostly)
To: ham-ant@ucsd.edu

I'm intrerested in hunting articles in old QST and 73 for articles on apartment VHF antennas. If you know of some specific articles devoted to that topic, would you please let me know.

— —

Joe Reid
jreid@csugrad.cs.vt.edu jreid@gnu.ai.mit.edu
rri!jreid@vtserf.cc.vt.edu vpcjoe@vtcs1.cs.vt.edu
UNIX Systems Administrator, pool player, and professional do-nothing

Date: Tue, 3 Aug 1993 13:16:22 EDT

From: haven.umd.edu!darwin.sura.net!europa.eng.gtefsd.com!news.ans.net!
malgudi.oar.net!news.ysu.edu!psuvm!dxt100@ames.arpa
Subject: balanced and unbalanced lines?
To: ham-ant@ucsd.edu

What's the purpose of an unbalanced line? To obtain 1/2 impedance of the
balanced line?

Date: Tue, 3 Aug 1993 18:11:44 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!usenet.ins.cwru.edu!magnus.acs.ohio-
state.edu!math.ohio-state.edu!darwin.sura.net!rsg1.er.usgs.gov!dgg.cr.usgs.gov!
bodoh@network.ucsd.edu
Subject: balanced and unbalanced lines?
To: ham-ant@ucsd.edu

In article <93215.131622DXT100@psuvm.psu.edu>, <DXT100@psuvm.psu.edu> writes:
|> What's the purpose of an unbalanced line? To obtain 1/2 impedance of the
|> balanced line?

The ADVANTAGE of a balanced line (twin lead) over an unbalanced line (coaxial)
is that it has less loss, although it is not as good at spurious signal
rejection. It is certainly possible to have 75 ohm balanced line and 300 ohm
unbalanced line - so impedance does not really correspond to whether the line
is balanced or unbalanced...

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+++++
+ Tom Bodoh - Sr. systems software engineer, Hughes STX, N0Y?? (in the mail) +
+ USGS/EROS Data Center, Sioux Falls, SD, USA 57198 (605) 594-6830 +
+ Internet; bodoh@dgg.cr.usgs.gov (152.61.192.66)

+
+ "Welcome back my friends to the show that never ends!" EL&P
+

+++++

Date: 3 Aug 93 15:26:27 GMT
From: ogicse!uwm.edu!cs.utexas.edu!gerald@cc.utexas.edu!portal.austin.ibm.com!
awdprime.austin.ibm.com!mcalle@network.ucsd.edu
Subject: GAP antenna
To: ham-ant@ucsd.edu

Are the GAP antennas so bad that nobody in this group knows anything
about it?

Maurice

Date: 4 Aug 1993 02:42:02 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!
europa.eng.gtefsd.com!news.ans.net!rpi!rs6321.ecs.rpi.edu!maessm@network.ucsd.edu
Subject: GAP antenna
To: ham-ant@ucsd.edu

In article <CB6w83.1z53@austin.ibm.com>, mcalle@austin.ibm.com (Calle) writes:

|> Are the GAP antennas so bad that nobody in this group knows anything
|> about it?

Not at all.

I had a GAP DX-VI up for about a year at my home. I installed it as per the instructions in the middle of my backyard. The SWR on 80-10 was just as they advertised - less than 2:1. Even though they advertise the antenna as covering 6 and 2 meters, the SWR is high on both bands and the antenna did not radiate well on either.

Performance was about what I expected it to be - better than a ground-fed vertical (i.e., Butternut HF-6V), but not as good as a beam. The antenna has very good low-angle radiation on 80 and 40, but nothing to speak of in high-angle radiation, so it will work far-out stations very well, but is not too good for local contacts. On the upper bands (20, 15, 10), The antenna, on average, outperformed my dipole by 3 to 6 dB (empirical test - not exact numbers). However on some signals, particularly fading signals on 10, the dipole was the better antenna.

If you're looking for one antenna that does all the HF bands, this is the antenna for you. If you want to work DX on 20-10m, you're better off getting a tribander and a tower, if space allows.

--
Mat Maessen N2NJZ | maessm@rpi.edu

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disclaimer: Anyone NOT singing will have a can of Foster's lobbed at their heads.

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Date: Tue, 3 Aug 1993 15:51:28 GMT
From: concert!gatech!wa4mei!ke4zv!gary@decwrl.dec.com
Subject: Some Fundamental Antenna Questions

To: ham-ant@ucsd.edu

In article <1993Aug2.204550.27778@genroco.com> don@grc.genroco.com (Don Woelz) writes:

>

>1. One respondent to my questions indicated that the apparent
>feedpoint impedance of a dipole antenna looks different to an
>unbalanced transmission line than it does to a balanced transmission
>line (unbalanced = 1/2 balanced). So, for instance, if I calculate
>the dipole feedpoint impedance to be 50 ohms, it is indeed 50 ohms
>for balanced line, but it is 25 ohms for an unbalanced coax feedline
>(assuming center conductor to one side of the dipole, shield to the
>other). Anyone care to comment on this? I could not find a
>reliable reference for it.

This is nonsense. The feedpoint impedance of the antenna is solely determined by the antenna. The feedline type has nothing to do with it, a resistor would match the antenna just as well. A feedline stuck in the near field of the antenna *can* change the antenna's impedance at the feedpoint as well as its pattern, but that's a different issue.

>2. Another concept that I had trouble verifying...the gain of an
>antenna is different for receiving than for transmitting. The basis
>for this argument is that when transmitting, an antenna is
>essentially a current driven device; when receiving, it is a voltage
>sensitive device. What's the scoop on this?

Well there's something to this, sort of. It's called aperture, or capture area. A physically larger antenna will intercept more of the passing wavefronts than a smaller antenna, *independent of frequency*. The absolute power collection you get from a large antenna will be greater than from a small antenna, even if both have the same directional gain. IE the antenna also works better in directions *other* than the main lobe than does a small antenna. Directional gain is a ratio with more signal in one direction coming at the expense of signal in another direction. If one antenna gathers more signal overall, it can have the same, or even less gain than another and still put more microvolts at your receiver. However, if "gain" is referenced to the mythic isotropic radiator, or a reference dipole, then gain and capture area scale together. A big antenna has more gain than a small one *for the same frequency*.

So we're dealing with two concepts here. Physically large antennas have greater capture area than physically small antennas independent of frequency, but for a given frequency, physically larger antennas also have greater gain than physically smaller antennas. (Assuming both are designed well for the application.)

Now let's look at transmission. Assuming the antenna is efficient, at least dipole size, all antennas will radiate the same absolute power when fed by the same power transmitter. However, for a given frequency, a larger antenna may show greater directional gain than a small one. (Again assuming both are well designed.) That gain comes through a reduction in radiated power in other directions. So, higher directional gain satisfies the reciprocity theorem, but absolute radiated signal on transmit is dependent only on transmitter power and antenna efficiency while absolute signal levels on receive are dependent on antenna capture area and antenna efficiency. We see that antenna gain is the same on transmit and receive, and antenna efficiency is assumed to be the same on transmit and receive. That leaves two different quantities to determine absolute transmit and absolute receive signals, transmitter power on one hand, and capture area on the other. Obviously, these two are not related by the reciprocity theorem. So receive and transmit signal strengths *can* be non-reciprocal, though receive and transmit *gains* cannot be.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Wed, 4 Aug 1993 02:32:31 GMT

From: usc!sdd.hp.com!col.hp.com!news.dtc.hp.com!srngenprp!alanb@network.ucsd.edu

Subject: Some Fundamental Antenna Questions

To: ham-ant@ucsd.edu

Gary Coffman (gary@ke4zv.uucp) wrote:

: ... A physically larger antenna will intercept more of the passing
 : wavefronts than a smaller antenna, *independent of frequency*. The absolute
 : power collection you get from a large antenna will be greater than from a
 : small antenna, even if both have the same directional gain.

Not true. First of all, it is possible for a physically small antenna to have an aperture (capture area) much greater than its physical size. If you could build a 1 meter diameter loop antenna for the 80 meter band with zero loss, it would have an aperture nearly as large as a full-sized 80 meter dipole (about 800 square meters).

Any two antennas (on the same frequency) with the same gain have the same aperture, according to the equation $A = \lambda^2 G / (4 \pi)$, where A is the aperture, λ is the wavelength and G is the gain.

AL N1AL

Date: Wed, 4 Aug 1993 02:24:46 GMT
From: usc!sdd.hp.com!col.hp.com!news.dtc.hp.com!srngenprp!alanb@network.ucsd.edu
Subject: Some Fundamental Antenna Questions
To: ham-ant@ucsd.edu

Robert Casey (wa2ise@netcom.com) wrote:

: In article <CB5v0L.8xE@srngenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:

..
: >Not true at all. Antenna gain is the same on receive as on transmit.
: >For example, if you change your antenna from a dipole to a 10-db-gain
: >beam, both your transmitted and received signals will get 10 dB louder.

: Maybe a related issue is the amount of signal power an antenna intercepts.
: Compare a system using a dipole at 80 meters and a 1 watt transmitter
: sending to a reciever tuned to that 80 meter freq using a 80m dipole, to
: another system at 2 meters (1 watt transmitter and 2m dipole sending to a 2m
: reciever using a 2m dipole), both systems's transmitter and recieving
: antennas seperated by 1 mile. Both transmitting dipoles are equally
: efficient radiating their respective signal, but would the bigger 80m
: dipole intercept more of the signal out of the air than the 2m dipole
: would (being 40 times bigger)? (been a long time since I took Electro-
: magnetic Fields class, ECE324 at Syracuse U. :-)

Yes. The 2 meter dipole and the 80 meter dipole have the same gain.
Assuming equal transmit power, each would create the same field strength
(watts per square meter) at a given distance.

However, the aperture (capture area) of the 80 meter antenna would be
 $40^2 = 1600$ times bigger. The formula is:

$$A = (\lambda)^2 G / (4 \pi)$$

where A is the aperture, λ is the wavelength, G is the gain over
isotropic and π is 3.14... So the path loss (ratio of transmitted power
to received power) would be 1600 times (32 dB) greater on 2 meters
(assuming free space).

By the way, next time somebody tells you that a certain antenna has
lots of gain but not much capture area (or vice versa), show them the
above formula. For a given frequency, gain and aperture are different
measures of the same thing.

AL N1AL

Date: Tue, 3 Aug 1993 14:53:36 GMT
From: europa.eng.gtefsd.com!darwin.sura.net!news-feed-2.peachnet.edu!concert!
inxs.concert.net!taco!THOMAS%BAEPV3.NCSU.EDU@uunet.uu.net
Subject: VHF homebrew?
To: ham-ant@ucsd.edu

This is not really radio related...but with the wealth of knowledge
and kindly responses in this newsgroup :) I thought I'd ask it anyway.

A while back I found a design for a homemade UHF (TV) antenna. It works
great for stations all the way down to about 8, so it does do reasonable
well VHF. Now ... can anyone direct me to a source for a VHF homebrew?

I appreciate the responses in advance. Thanks

Scot Thomas thomas@bae.ncsu.edu

Date: 3 Aug 93 13:15:51 -0500
From: usc!math.ohio-state.edu!darwin.sura.net!wvnmms.wvnet.edu!marshall.wvnet.edu!
desaid@network.ucsd.edu
To: ham-ant@ucsd.edu

References <CAQLGy.9E@dxis.monroe.pa.us>, <2314a5\$40j@news.acns.nwu.edu>,
<236sg9\$515@skeena.ucs.ubc.ca>
Subject : Re: Trunk Lip Mount Antenna?

In article <236sg9\$515@skeena.ucs.ubc.ca>, taganov@unixg.ubc.ca (Robert Edgar
Froese) writes:

> In article <2314a5\$40j@news.acns.nwu.edu> rdewan@casbah.acns.nwu.edu (Rajiv
Dewan) writes:

>

>>If you are worried about rusting, then insist on stainless steel set
>>screws too. I have seen a Diamond TL mount after use for a few months
>>and it is not a pretty picture. While the body is made of SS,
>>the set screws are steel and were completely rusted.

>

> -----
> I have an Engineer friend (my Dentist, actually) who told me that an
> electrochemical potential exists when Stainless Steel and normal, auto
> grade steel are brought together that results in fantastically accelerated
> corrosion at the mating point. Seems that this could have been what
> caused your screws to go so fast, and if you used stainless screws, the
> holes would probably go first. I haven't asked him about Brass, but will
> be sure to do so when I get my next mercury filling...

>
>>Rajiv
>
>
>
> >aa9ch
>>Address: r-dewan@nwu.edu
>>Phone: None on HF. Only CW.
>> Look for aa9ch/m on bottom end of 10m-80m.
>
>
> --
> Robert Froese VE7MOQ
> taganov biogeocoenose approach "Clearcutting is not a Crime"
> taganov@unixg.ubc.ca

End of Ham-Ant Digest V93 #1
